



IFWO

RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/798,278

DATE: 08/31/2004

TIME: 12:50:47

Input Set : N:\Cr3\RULE60\10798278.raw

Output Set: N:\CRF4\08312004\J798278.raw

1 <110> APPLICANT: ARAKI, HIROYUKI
 2 ENDO, KEIJI
 3 HAGIHARA, HIROSHI
 4 IGARASHI, KAZUAKI
 5 HAYASHI, YASUHIRO
 6 OZAKI, KATSUYA
 7 <120> TITLE OF INVENTION: HIGHLY PRODUCTIVE ALPHA-AMYLASES
 8 <130> FILE REFERENCE: 214377US0
 9 <140> CURRENT APPLICATION NUMBER: US/10/798,278
 10 <141> CURRENT FILING DATE: 2004-03-12
 11 <150> PRIOR APPLICATION NUMBER: US/09/971,611
 12 <151> PRIOR FILING DATE: 2001-10-09
 13 <150> PRIOR APPLICATION NUMBER: JP 2000/310605
 14 <151> PRIOR FILING DATE: 2001-10-11
 15 <160> NUMBER OF SEQ ID NOS: 51
 16 <170> SOFTWARE: PatentIn version 3.1
 18 <210> SEQ ID NO: 1
 19 <211> LENGTH: 1786
 20 <212> TYPE: DNA
 21 <213> ORGANISM: Bacillus sp. KSM-AP1378
 22 <220> FEATURE:
 23 <221> NAME/KEY: sig_peptide
 24 <222> LOCATION: (155)..(247)
 25 <223> OTHER INFORMATION:
 26 <221> NAME/KEY: mat_peptide
 27 <222> LOCATION: (248)..()
 28 <223> OTHER INFORMATION:

--> 29 <221> CDS

30 <222> LOCATION: (155)..(1702)

31 <223> OTHER INFORMATION:

--> 32 <400> 1

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34	gagaaaaaac ttgggagtta ggaagtata ttaaaggatt ttttttgact tgttgtgaaa	120
35	acgcttgcat aaattgaagg agagggtgct tttt atg aaa ctt cat aac cgt ata	175
36		
37	Met Lys Leu His Asn Arg Ile	
	-30 -25	
38	att agc gta cta tta aca cta ttg tta gct gta gct gtt ttg ttt cca	223
39	Ile Ser Val Leu Leu Thr Leu Leu Leu Ala Val Ala Val Leu Phe Pro	
40	-20 -15 -10	
41	tat atg acg gaa cca gca caa gcc cat cat aat ggg acg aat ggg acc	271
42	Tyr Met Thr Glu Pro Ala Gln Ala His His Asn Gly Thr Asn Gly Thr	
43	-5 -1 1 5	
44	atg atg cag tat ttt gaa tgg cat ttg cca aat gac ggg aac cac tgg	319

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45	Met	Met	Gln	Tyr	Phe	Glu	Trp	His	Leu	Pro	Asn	Asp	Gly	Asn	His	Trp	
46		10					15					20					
47	aac	agg	tta	cga	gat	gac	gca	gct	aac	tta	aag	agt	aaa	ggg	att	acc	367
48	Asn	Arg	Leu	Arg	Asp	Asp	Ala	Ala	Asn	Leu	Lys	Ser	Lys	Gly	Ile	Thr	
49	25					30					35				40		
50	gct	gtt	tgg	att	cct	cct	gca	tgg	aag	ggg	act	tcg	caa	aat	gat	gtt	415
51	Ala	Val	Trp	Ile	Pro	Pro	Ala	Trp	Lys	Gly	Thr	Ser	Gln	Asn	Asp	Val	
52					45					50				55			
53	ggg	tat	ggg	gcc	tat	gat	ttg	tac	gat	ctt	ggg	gag	ttt	aac	caa	aag	463
54	Gly	Tyr	Gly	Ala	Tyr	Asp	Leu	Tyr	Asp	Leu	Gly	Glu	Phe	Asn	Gln	Lys	
55				60					65				70				
56	gga	acc	gtc	cgt	aca	aaa	tat	ggc	aca	agg	agt	cag	ttg	caa	ggg	gcc	511
57	Gly	Thr	Val	Arg	Thr	Lys	Tyr	Gly	Thr	Arg	Ser	Gln	Leu	Gln	Gly	Ala	
58			75					80				85					
59	gtg	aca	tct	ttg	aaa	aat	aac	ggg	att	caa	gtt	tat	ggg	gat	gtc	gtg	559
60	Val	Thr	Ser	Leu	Lys	Asn	Asn	Gly	Ile	Gln	Val	Tyr	Gly	Asp	Val	Val	
61		90				95				100							
62	atg	aat	cat	aaa	ggg	gga	gca	gac	ggg	aca	gag	atg	gta	aat	gcg	gtg	607
63	Met	Asn	His	Lys	Gly	Gly	Ala	Asp	Gly	Thr	Glu	Met	Val	Asn	Ala	Val	
64	105				110					115					120		
65	gaa	gtg	aac	cga	agc	aac	cga	aac	caa	gaa	ata	tca	ggg	gaa	tac	acc	655
66	Glu	Val	Asn	Arg	Ser	Asn	Arg	Asn	Gln	Glu	Ile	Ser	Gly	Glu	Tyr	Thr	
67				125					130				135				
68	att	gaa	gca	tgg	acg	aaa	ttt	gat	ttc	cct	gga	aga	gga	aat	acc	cat	703
69	Ile	Glu	Ala	Trp	Thr	Lys	Phe	Asp	Phe	Pro	Gly	Arg	Gly	Asn	Thr	His	
70			140					145				150					
71	tcc	aac	ttt	aaa	tgg	cgc	tgg	tat	cat	ttt	gat	ggg	aca	gat	tgg	gat	751
72	Ser	Asn	Phe	Lys	Trp	Arg	Trp	Tyr	His	Phe	Asp	Gly	Thr	Asp	Trp	Asp	
73			155					160				165					
74	cag	tca	cgt	cag	ctt	cag	aac	aaa	ata	tat	aaa	ttc	aga	ggg	acc	gga	799
75	Gln	Ser	Arg	Gln	Leu	Gln	Asn	Lys	Ile	Tyr	Lys	Phe	Arg	Gly	Thr	Gly	
76		170				175				180							
77	aag	gca	tgg	gac	tgg	gaa	gta	gat	ata	gag	aac	ggc	aac	tat	gat	tac	847
78	Lys	Ala	Trp	Asp	Trp	Glu	Val	Asp	Ile	Glu	Asn	Gly	Asn	Tyr	Asp	Tyr	
79	185				190					195				200			
80	ctt	atg	tat	gca	gac	att	gat	atg	gat	cat	cca	gaa	gta	atc	aat	gaa	895
81	Leu	Met	Tyr	Ala	Asp	Ile	Asp	Met	Asp	His	Pro	Glu	Val	Ile	Asn	Glu	
82				205					210				215				
83	ctt	aga	aat	tgg	gga	gtt	tgg	tat	aca	aat	aca	ctt	aat	cta	gat	gga	943
84	Leu	Arg	Asn	Trp	Gly	Val	Trp	Tyr	Thr	Asn	Thr	Leu	Asn	Leu	Asp	Gly	
85			220					225				230					
86	ttt	aga	atc	gat	gct	gtg	aaa	cat	att	aaa	tac	agc	tat	acg	aga	gat	991
87	Phe	Arg	Ile	Asp	Ala	Val	Lys	His	Ile	Lys	Tyr	Ser	Tyr	Thr	Arg	Asp	
88		235						240				245					
89	tgg	cta	aca	cat	gtg	cgt	aac	acc	aca	ggg	aaa	cca	atg	ttt	gca	gtt	1039
90	Trp	Leu	Thr	His	Val	Arg	Asn	Thr	Thr	Gly	Lys	Pro	Met	Phe	Ala	Val	
91		250				255				260							
92	gca	gaa	ttt	tgg	aaa	aat	gac	ctt	gct	gca	atc	gaa	aac	tat	tta	aat	1087
93	Ala	Glu	Phe	Trp	Lys	Asn	Asp	Leu	Ala	Ala	Ile	Glu	Asn	Tyr	Leu	Asn	

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Input Set : N:\Crf3\RULE60\10798278.raw

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94      265      270      275      280
95      aaa aca agt tgg aat cac tcc gtg ttc gat gtt cct ctt cat tat aat      1135
96      Lys Thr Ser Trp Asn His Ser Val Phe Asp Val Pro Leu His Tyr Asn
97      285      290      295
98      ttg tac aat gca tct aat agt ggt ggc tat ttt gat atg aga aat att      1183
99      Leu Tyr Asn Ala Ser Asn Ser Gly Gly Tyr Phe Asp Met Arg Asn Ile
100     300      305      310
101     tta aat ggt tct gtc gta caa aaa cac cct ata cat gca gtc aca ttt      1231
102     Leu Asn Gly Ser Val Val Gln Lys His Pro Ile His Ala Val Thr Phe
103     315      320      325
104     gtt gat aac cat gac tct cag cca gga gaa gca ttg gaa tcc ttt gtt      1279
105     Val Asp Asn His Asp Ser Gln Pro Gly Glu Ala Leu Glu Ser Phe Val
106     330      335      340
107     caa tcg tgg ttc aaa cca ctg gca tat gca ttg att ctg aca agg gag      1327
108     Gln Ser Trp Phe Lys Pro Leu Ala Tyr Ala Leu Ile Leu Thr Arg Glu
109     345      350      355      360
110     caa ggt tac cct tcc gta ttt tac ggt gat tac tac ggt ata cca act      1375
111     Gln Gly Tyr Pro Ser Val Phe Tyr Gly Asp Tyr Tyr Gly Ile Pro Thr
112     365      370      375
113     cat ggt gtt cct tcg atg aaa tct aaa att gat cca ctt ctg cag gca      1423
114     His Gly Val Pro Ser Met Lys Ser Lys Ile Asp Pro Leu Leu Gln Ala
115     380      385      390
116     cgt caa acg tat gcc tac gga acc caa cat gat tat ttt gat cat cat      1471
117     Arg Gln Thr Tyr Ala Tyr Gly Thr Gln His Asp Tyr Phe Asp His His
118     395      400      405
119     gat att atc ggc tgg acg aga gaa ggg gac agc tcc cac cca aat tca      1519
120     Asp Ile Ile Gly Trp Thr Arg Glu Gly Asp Ser Ser His Pro Asn Ser
121     410      415      420
122     gga ctt gca act att atg tcc gat ggg cca ggg ggt aat aaa tgg atg      1567
123     Gly Leu Ala Thr Ile Met Ser Asp Gly Pro Gly Gly Asn Lys Trp Met
124     425      430      435      440
125     tat gtc ggg aaa cat aaa gct ggc caa gta tgg aga gat atc acc gga      1615
126     Tyr Val Gly Lys His Lys Ala Gly Gln Val Trp Arg Asp Ile Thr Gly
127     445      450      455
128     aat agg tct ggt acc gtc acc att aat gca gat ggt tgg ggg aat ttc      1663
129     Asn Arg Ser Gly Thr Val Thr Ile Asn Ala Asp Gly Trp Gly Asn Phe
130     460      465      470
131     act gta aac gga ggg gca gtt tcg gtt tgg gtg aag caa taaataagga      1712
132     Thr Val Asn Gly Gly Ala Val Ser Val Trp Val Lys Gln
133     475      480      485
134     acaagaggcg aaaattactt tctacatgc agagctttcc gatcactcat acaccaata      1772
135     taaattggaa gctt      1786
137 <210> SEQ ID NO: 2
138 <211> LENGTH: 516
139 <212> TYPE: PRT
140 <213> ORGANISM: Bacillus sp. KSM-AP1378
141 <400> SEQUENCE: 2
142     Met Lys Leu His Asn Arg Ile Ile Ser Val Leu Leu Thr Leu Leu Leu
143     -30      -25      -20

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144 Ala Val Ala Val Leu Phe Pro Tyr Met Thr Glu Pro Ala Gln Ala His
145 -15 -10 -5 -1 1
146 His Asn Gly Thr Asn Gly Thr Met Met Gln Tyr Phe Glu Trp His Leu
147 5 10 15
148 Pro Asn Asp Gly Asn His Trp Asn Arg Leu Arg Asp Asp Ala Ala Asn
149 20 25 30
150 Leu Lys Ser Lys Gly Ile Thr Ala Val Trp Ile Pro Pro Ala Trp Lys
151 35 40 45
152 Gly Thr Ser Gln Asn Asp Val Gly Tyr Gly Ala Tyr Asp Leu Tyr Asp
153 50 55 60 65
154 Leu Gly Glu Phe Asn Gln Lys Gly Thr Val Arg Thr Lys Tyr Gly Thr
155 70 75 80
156 Arg Ser Gln Leu Gln Gly Ala Val Thr Ser Leu Lys Asn Asn Gly Ile
157 85 90 95
158 Gln Val Tyr Gly Asp Val Val Met Asn His Lys Gly Gly Ala Asp Gly
159 100 105 110
160 Thr Glu Met Val Asn Ala Val Glu Val Asn Arg Ser Asn Arg Asn Gln
161 115 120 125
162 Glu Ile Ser Gly Glu Tyr Thr Ile Glu Ala Trp Thr Lys Phe Asp Phe
163 130 135 140 145
164 Pro Gly Arg Gly Asn Thr His Ser Asn Phe Lys Trp Arg Trp Tyr His
165 150 155 160
166 Phe Asp Gly Thr Asp Trp Asp Gln Ser Arg Gln Leu Gln Asn Lys Ile
167 165 170 175
168 Tyr Lys Phe Arg Gly Thr Gly Lys Ala Trp Asp Trp Glu Val Asp Ile
169 180 185 190
170 Glu Asn Gly Asn Tyr Asp Tyr Leu Met Tyr Ala Asp Ile Asp Met Asp
171 195 200 205
172 His Pro Glu Val Ile Asn Glu Leu Arg Asn Trp Gly Val Trp Tyr Thr
173 210 215 220 225
174 Asn Thr Leu Asn Leu Asp Gly Phe Arg Ile Asp Ala Val Lys His Ile
175 230 235 240
176 Lys Tyr Ser Tyr Thr Arg Asp Trp Leu Thr His Val Arg Asn Thr Thr
177 245 250 255
178 Gly Lys Pro Met Phe Ala Val Ala Glu Phe Trp Lys Asn Asp Leu Ala
179 260 265 270
180 Ala Ile Glu Asn Tyr Leu Asn Lys Thr Ser Trp Asn His Ser Val Phe
181 275 280 285
182 Asp Val Pro Leu His Tyr Asn Leu Tyr Asn Ala Ser Asn Ser Gly Gly
183 290 295 300 305
184 Tyr Phe Asp Met Arg Asn Ile Leu Asn Gly Ser Val Val Gln Lys His
185 310 315 320
186 Pro Ile His Ala Val Thr Phe Val Asp Asn His Asp Ser Gln Pro Gly
187 325 330 335
188 Glu Ala Leu Glu Ser Phe Val Gln Ser Trp Phe Lys Pro Leu Ala Tyr
189 340 345 350
190 Ala Leu Ile Leu Thr Arg Glu Gln Gly Tyr Pro Ser Val Phe Tyr Gly
191 355 360 365
192 Asp Tyr Tyr Gly Ile Pro Thr His Gly Val Pro Ser Met Lys Ser Lys

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Input Set : N:\Crif3\RULE60\10798278.raw

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193      370      375      380      385
194      Ile Asp Pro Leu Leu Gln Ala Arg Gln Thr Tyr Ala Tyr Gly Thr Gln
195      390      395      400
196      His Asp Tyr Phe Asp His His Asp Ile Ile Gly Trp Thr Arg Glu Gly
197      405      410      415
198      Asp Ser Ser His Pro Asn Ser Gly Leu Ala Thr Ile Met Ser Asp Gly
199      420      425      430
200      Pro Gly Gly Asn Lys Trp Met Tyr Val Gly Lys His Lys Ala Gly Gln
201      435      440      445
202      Val Trp Arg Asp Ile Thr Gly Asn Arg Ser Gly Thr Val Thr Ile Asn
203      450      455      460      465
204      Ala Asp Gly Trp Gly Asn Phe Thr Val Asn Gly Gly Ala Val Ser Val
205      470      475      480
206      Trp Val Lys Gln
207      485
209 <210> SEQ ID NO: 3
210 <211> LENGTH: 1753
211 <212> TYPE: DNA
212 <213> ORGANISM: Bacillus sp. KSM-K38
213 <220> FEATURE:
214 <221> NAME/KEY: sig_peptide
215 <222> LOCATION: (162)..(224)
216 <223> OTHER INFORMATION:
217 <221> NAME/KEY: mat_peptide
218 <222> LOCATION: (225)..()
219 <223> OTHER INFORMATION:
--> 220 <221> CDS
221 <222> LOCATION: (162)..(1664)
222 <223> OTHER INFORMATION:
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226      ttatgatata tgtaagcggt atcattaaaa ggaggtattt g atg aga aga tgg gta      176
227      Met Arg Arg Trp Val
228      -20
229      gta gca atg ttg gca gtg tta ttt tta ttt cct tcg gta gta gtt gca      224
230      Val Ala Met Leu Ala Val Leu Phe Leu Phe Pro Ser Val Val Val Ala
231      -15      -10      -5      -1
232      gat gga ttg aac ggt acg atg atg cag tat tat gag tgg cat ttg gaa      272
233      Asp Gly Leu Asn Gly Thr Met Met Gln Tyr Tyr Glu Trp His Leu Glu
234      1      5      10      15
235      aac gac ggg cag cat tgg aat cgg ttg cac gat gat gcc gca gct ttg      320
236      Asn Asp Gly Gln His Trp Asn Arg Leu His Asp Asp Ala Ala Ala Leu
237      20      25      30
238      agt gat gct ggt att aca gct att tgg att ccg cca gcc tac aaa ggt      368
239      Ser Asp Ala Gly Ile Thr Ala Ile Trp Ile Pro Pro Ala Tyr Lys Gly
240      35      40      45
241      aat agt cag gcg gat gtt ggg tac ggt gca tac gat ctt tat gat tta      416
242      Asn Ser Gln Ala Asp Val Gly Tyr Gly Ala Tyr Asp Leu Tyr Asp Leu

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RAW SEQUENCE LISTING ERROR SUMMARY
PATENT APPLICATION: US/10/798,278

DATE: 08/31/2004
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Input Set : N:\Crf3\RULE60\10798278.raw
Output Set: N:\CRF4\08312004\J798278.raw

Please Note:

se of n and/or Xaa have been detected in the Sequence Listing. Please review the
equence Listing to ensure that a corresponding explanation is presented in the <220>
o <223> fields of each sequence which presents at least one n or Xaa.

eq#:33; N Pos. 16,17,18
eq#:34; N Pos. 16,17,18
eq#:35; N Pos. 16,17,18
eq#:36; N Pos. 16,17,18
eq#:42; N Pos. 27
eq#:48; N Pos. 19,20,21

VERIFICATION SUMMARY

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Input Set : N:\Crf3\RULE60\10798278.raw

Output Set: N:\CRF4\08312004\J798278.raw

L:29 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:1
L:29 M:258 W: Mandatory Feature missing, <223> Blank for SEQ#:1,Line#:0
L:32 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:1
L:32 M:258 W: Mandatory Feature missing, <223> Blank for SEQ#:1,Line#:0
L:32 M:258 W: Mandatory Feature missing, <223> Blank for SEQ#:1,Line#:0
L:220 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:3
L:220 M:258 W: Mandatory Feature missing, <223> Blank for SEQ#:3,Line#:0
L:223 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:3
L:223 M:258 W: Mandatory Feature missing, <223> Blank for SEQ#:3,Line#:0
L:223 M:258 W: Mandatory Feature missing, <223> Blank for SEQ#:3,Line#:0
L:653 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!
L:656 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:33
L:657 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:33 after pos.:0
L:665 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!
L:668 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:34
L:669 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:34 after pos.:0
L:677 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!
L:680 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:35
L:681 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:35 after pos.:0
L:689 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!
L:692 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:36
L:693 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:36 after pos.:0
L:746 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!
L:749 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:42
L:750 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:42 after pos.:0
L:803 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!
L:806 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:48
L:807 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:48 after pos.:0